

# PATENT COOPERATION TREATY

From the  
INTERNATIONAL PRELIMINARY EXAMINING AUTHORITY

## PCT

<b>To:</b>  KAWAGUCHI, Yoshiyuki SERA, TOYAMA, MATSUKURA & KAWAGUCHI 4-10, Higashi Nihonbashi 3, chome, Chuo-ku, Tokyo 103-0004 JAPON
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NOTIFICATION OF TRANSMITTAL OF  
THE INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(PCT Rule 71.1)

Applicant's or agent's file reference 2004280C4088	<b>IMPORTANT NOTIFICATION</b>
International application No. PCT/JP2004/016072	International filing date (day/month/year) 22.10.2004
Priority date (day/month/year) 18.11.2003	Applicant TOYOTA JIDOSHA KABUSHIKI KAISHA et al.

1. The applicant is hereby notified that this International Preliminary Examining Authority transmits herewith the international preliminary report on patentability and its annexes, if any, established on the international application.
2. A copy of the report and its annexes, if any, is being transmitted to the International Bureau for communication to all the elected Offices.
3. Where required by any of the elected Offices, the International Bureau will prepare an English translation of the report (but not of any annexes) and will transmit such translation to those Offices.
4. **REMINDER**

The applicant must enter the national phase before each elected Office by performing certain acts (filing translations and paying national fees) within 30 months from the priority date (or later in some Offices) (Article 39(1)) (see also the reminder sent by the International Bureau with Form PCT/IB/301).

Where a translation of the international application must be furnished to an elected Office, that translation must contain a translation of any annexes to the international preliminary report on patentability. It is the applicant's responsibility to prepare and furnish such translation directly to each elected Office concerned.

For further details on the applicable time limits and requirements of the elected Offices, see Volume II of the PCT Applicant's Guide.

The applicant's attention is drawn to Article 33(5), which provides that the criteria of novelty, inventive step and industrial applicability described in Article 33(2) to (4) merely serve the purposes of international preliminary examination and that "any Contracting State may apply additional or different criteria for the purposes of deciding whether, in that State, the claimed inventions is patentable or not" (see also Article 27(5)). Such additional criteria may relate, for example, to exemptions from patentability, requirements for enabling disclosure, clarity and support for the claims.

Name and mailing address of the International preliminary examining authority:  <div style="display: flex; align-items: center;"> <div>             European Patent Office              D-80298 Munich              Tel. +49 89 2399 - 0 Tx: 523656 epmu d              Fax: +49 89 2399 - 4465           </div> </div>	Authorized Officer  Lorenz, S  Tel. +49 89 2399-2992
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# PATENT COOPERATION TREATY

## PCT

### INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2004280C4088		<b>FOR FURTHER ACTION</b>		See Form PCT/PEA/416
International application No. PCT/JP2004/016072		International filing date (day/month/year) 22.10.2004		Priority date (day/month/year) 18.11.2003
International Patent Classification (IPC) or national classification and IPC G06F9/46				
Applicant TOYOTA JIDOSHA KABUSHIKI KAISHA et al.				
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>				
<p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the opinion</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p>				
Date of submission of the demand  31.05.2005		Date of completion of this report  13.10.2005		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465		Authorized Officer  Kalejs, E  Telephone No. +49 89 2399- 6919		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

80/579339  
JAP200331 JUN 10 15 MAY 2006  
International application No.  
PCT/JP2004/016072

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
  - ☐ publication of the international application (under Rule 12.4)
  - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report)*:

**Description, Pages**

1-21 as originally filed

**Claims, Numbers**

1-4 as originally filed

**Drawings, Sheets**

1/4-4/4 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):
4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
- ☐ the description, pages
  - ☐ the claims, Nos.
  - ☐ the drawings, sheets/figs
  - ☐ the sequence listing (*specify*):
  - ☐ any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/JP2004/016072

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

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**1. Statement**

Novelty (N)	Yes: Claims	1-4
	No: Claims	
Inventive step (IS)	Yes: Claims	1-4
	No: Claims	
Industrial applicability (IA)	Yes: Claims	1-4
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**INTERNATIONAL PRELIMINARY  
REPORT ON PATENTABILITY  
(SEPARATE SHEET)**

10/579339  
1AP20Rec'd PCT/PTO 15 MAY 2006

International application No.

PCT/JP2004/016072

**Re Item V.**

1. The following documents are referred to in this communication:

- D1: AUDSLEY N C ET AL: "hard real-time scheduling: the Deadline-Monotonic approach" PROCEEDINGS OF THE IFAC/IFIC WORKSHOP, REAL TIME PROGRAMMING, OXFORD, GB, 23 June 1992 (1992-06-23), pages 55-60, XP002243648
- D2: CHIA SHEN ET AL: "RESOURCE RECLAIMING IN MULTIPROCESSOR REAL-TIME SYSTEMS" IEEE TRANSACTIONS ON PARALLEL AND DISTRIBUTED SYSTEMS, IEEE INC, NEW YORK, US, vol. 4, no. 4, 1 April 1993 (1993-04-01), pages 382-397, XP000381810 ISSN: 1045-9219
- D3: LEUNG J Y-T ET AL: "ON THE COMPLEXITY OF FIXED-PRIORITY SCHEDULING OF PERIODIC, REAL-TIME TASKS" PERFORMANCE EVALUATION, AMSTERDAM, NL, vol. 2, no. 4, December 1982 (1982-12), pages 237-250, XP008017817 ISSN: 0166-5316

2. Lack of inventive step, Article 33(3) PCT

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claim 1 does not involve an inventive step in the sense of Article 33(3) PCT.

The document D1 is regarded as being the closest prior art to the subject-matter of claim 1, and discloses (the references in parentheses applying to this document):

A task management system comprising:

- a judgement unit judging whether or not an execution of a task requiring access to a specified resource can be completed before deadline of said task, even if the execution start time for said task is delayed (page 56, column 1, last paragraph. D1 teaches that a task is judged schedulable, i.e it can be completed before its deadline if it doesn't miss its deadline even when all higher priority tasks execute simultaneously);

The subject-matter of claim 1 therefore differs from this known system of D1 in that the system of claim 1 further comprises:

- (a) a registration unit registering said task if the execution thereof can be completed before deadline;
- (b) a control unit halting a resource assignment to a task trying to access the specified resource until a resource assignment to a task having accessed said resource earlier is completed, when switching over the task.

The subject-matter of claim 1 is therefore new (Article 33(2) PCT).

The problem to be solved by the present invention may therefore be regarded as how to manage tasks utilizing the same resource.

The solution proposed in claim 1 of the present application cannot be considered as involving an inventive step (Article 33(3) PCT) for the following reasons:

The feature (a) actually represents a task scheduler which is a well-known and indispensable part of any system that performs task scheduling. Therefore said feature cannot contribute to inventive character of the alleged invention.

Regarding feature (b), the subject-matter thereof effectively amounts to not switching over to a task that requires a resource that is already being used by another task. However this principle is well-known and is considered to represent common general knowledge in the field in question. For example, document D2 (table 1; figures 9-11) shows a task scheduling scheme that ensures that task T4 is not executed simultaneously with task T2 because T4 requires an exclusive access to resource R1. While D2 discloses this principle in terms of a two processor system, the same concept applies also to single-processor arrangements, as the technical effect remains the same - tasks are not blocked during execution because of resource contention.

- 2.2 Claim 2 contains all features of claim 1 and will therefore be considered as its dependent claim, see also notes re. Item VIII below.

Dependent claim 2 does not contain any features which, in combination with the

features of any claim to which it refers, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

The only feature that claim 2 adds to the features disclosed in claim 1 is "an execution unit preferentially executing a task having a shorter period of deadline time among the tasks registered as the execution target tasks".

However, this feature is well-known. In fact, this is the basic principle of the Deadline Monotonic task scheduling algorithm (see document D3, page 240, column 1, lines 9-15) and therefore cannot contribute to the inventive character of the alleged invention.

- 2.3 Claim 3 discloses the same subject-matter as claim 1, only in terms of a method. Therefore the same objections apply also to claim 3 and its dependent claim 4.

**Re Item VIII.**

1. Lack of clarity, Article 6 PCT

- 1.1 Claims 2 and 4 comprise all the features of claims 1 and 3, respectively, and are therefore not appropriately formulated as claims dependent on them (Rule 6.4 PCT).